Kindergarten

Students use and understand the relationship between numbers to represent quantities up to 10 and to solve quantitative problems, such as counting objects in a set; counting out a given number of objects; comparing sets or numerals; and modeling simple joining and separating situations with sets of objects. Students sort, classify, and identify common objects around them and describe their geometric features and position. Students understand the concept of time and units to measure it. They understand that objects have length, capacity, weight, and temperature, and that they can compare objects using these qualities. Students choose, combine, and apply effective strategies for solving problems in reasonable ways and justifying their reasoning.

04301 Mathematics, Grade 1

Students understand symbols, objects, and pictures used to represent numbers up to 100 and show an understanding of fractions. Students develop strategies for adding and subtracting whole numbers based on their prior work with small numbers. They understand the connections between counting and addition and subtraction. Students relate word problems to number sentences in symbols. Students identify common geometric shapes. As students combine shapes, they recognize them from different perspectives and orientations, describe their geometric attributes, and determine how they are alike and different. Students learn how to measure length, as well as how to compare, order, and describe other kinds of measurement. They choose, combine, and apply effective strategies for solving problems in reasonable ways and justifying their reasoning.

04302 Mathematics, Grade 2

Students understand the relationship among numbers, quantities, and place value in whole numbers up to 100. They understand that fractions may refer to parts of a set and parts of a whole. Students use their understanding of addition to develop fluency with addition and subtraction within 100. They model, represent, and interpret number relationships to create and solve problems involving addition and subtraction. Students describe and analyze shapes by examining their sides and investigate, describe, and reason about decomposing and combining shapes to make other shapes. Students understand how to measure length, temperature, capacity, weight, and time in standard units. They choose, combine, and apply effective strategies for solving problems in reasonable ways and justifying their reasoning.

04303 Mathematics, Grade 3

Students understand the relationships among numbers, quantities, and place value in whole numbers up to 1,000. They understand the relationship among whole numbers, simple fractions, and decimals. Students solve problems involving addition and subtraction and develop an understanding of the meanings of multiplication and division of whole numbers through activities and problems involving equal-sized groups, arrays, and area models. They solve simple problems involving multiplication and division. Students select appropriate symbols, operations, and properties to represent, describe, simplify, and solve simple number and functional relationships. Students describe, analyze, and compare properties of two-dimensional shapes. They compare and classify shapes by their sides and angles, and connect these with definitions of shapes. Students choose and use appropriate units and measurement tools for length, capacity, weight, temperature, time and money. They choose, combine, and apply effective strategies for solving problems in reasonable ways, justifying their reasoning, and determine when a solution is complete and reasonable and move beyond a particular problem by generalizing to other situations.

04304 Mathematics, Grade 4

Students generalize their understanding of place value to 1,000,000, understanding the relative sizes of numbers in each place. They understand decimals to two decimal places and how whole number and decimals relate to simple fractions. Students solve problems involving addition, subtraction, multiplication, and division of whole numbers, as well as solve simple fraction and decimal problems. They use and interpret variables, mathematical symbols, and properties to write and simplify numerical expressions and sentences. Students describe, analyze, compare, and classify two-dimensional shapes. Through building, drawing, and analyzing two-dimensional shapes, students deepen their understanding of properties of two-dimensional objects and the use of them to solve problems involving symmetry. Students understand perimeter and area, as well as measuring volume, capacity, time, and money. They represent data on a number line and in frequency tables, interpret data graphs to answer questions, and show outcomes for simple probability situations. Students choose, combine, and apply effective strategies for solving problems in reasonable ways and justifying their reasoning. They determine when a solution is complete and reasonable and move beyond a particular problem by generalizing to other situations.

04305 Mathematics, Grade 5

Students solve problems involving multiplication and division of whole numbers and solve problems involving addition, subtraction, and simple multiplication and division of fractions and decimals. They understand the relationship among decimals, fractions, and percents and they understand the relative magnitudes of numbers. Students use variables in simple expressions, compute the value of an expression for specific values of the variable, and plot and interpret the results. They use two-dimensional coordinate grids to represent points and graph lines. Students identify, describe, and classify the properties of plane and solid geometric shapes and the relationship between them. They recognize volume as an attribute of three-dimensional space, aw well as measure weight, temperature, time and money. Students collect, display, analyze, compare and interpret data sets. Students choose, combine, and apply effective strategies for solving problems in reasonable ways and justifying their reasoning. They determine when a solution is complete and reasonable and move beyond a particular problem by generalizing to other situations.

04306, Mathematics Grade 6

Students perform operations on positive and negative integers, decimals, fractions, and mixed numbers. They find multiples and factors and solve problems involving ratios, proportions, and percentages. They construct and evaluate algebraic expressions, solve simple linear equations, and graph and interpret their result. They identify, describe, and classify the properties of plane and solid geometric shapes and the relationships between them, and investigate geometric relationships algebraically. Students extend their knowledge of plane and solid shapes to measurement and use this understanding to solve problems. They solve problems involving time and money and choose appropriate units in other areas. Students analyze data sets statistically and determine theoretical and experimental probabilities, using these probabilities to make predictions. Throughout the course, students use strategies, skill and concepts in finding and communicating solutions to problems and move beyond a particular problem by generalizing to other situations.

04307, Mathematics Grade 7

Students solve problems involving integers, fractions, decimals, ratios, percentages, scientific notation and square roots, converting between each of these forms as appropriate. They express quantitative relationships algebraically, using correct terminology, expressions, equations, inequalities, and graphs. They manipulate plane and solid geometric shapes and use similarity and congruence to solve problems. They analyze and compute measures of common geometric objects (including perimeter, area, and volume) and use these results to find measures of irregular objects. Students generate and analyze data sets, identifying relationships among

variables within a data set. They determine probabilities and use them to make predictions. Throughout the course, students use strategies, skill and concepts in finding and communicating solutions to problems and move beyond a particular problem by generalizing to other situations.

04308, Mathematics Grade 8

Students extend their knowledge of number sense to rational and irrational numbers and use and understand exponents, powers, and roots. They solve problems and make computations involving rational numbers, as well as problems involving ratios, proportions, and percentages. They solve linear equations and inequalities, and extend their previous knowledge of linear expressions to interpret and evaluate expressions with integer powers. They graph and interpret functions, understanding the concepts of slope and rate of change. They deepen their understanding of plane and solid geometric shapes and properties by construction shapes that meet given conditions, by identifying attributes of shapes, and by applying geometric concepts to solve problems. They apply scale factors to shapes and measurement of shapes, and use this understanding to solve problems. Students generate and analyze data sets, identifying relationships among variables within a data set. They determine probabilities and use them to make predictions. Throughout the course, students use strategies, skill and concepts in finding and communicating solutions to problems and move beyond a particular problem by generalizing to other situations.